



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/690,183	10/17/2000	Tadayoshi Kachi	TALW-0152	1660

7590

11/21/2002

Woodcock Washburn Kurtz Mackiewicz & Norris LLP
One Liberty Place 46th Floor
Philadelphia, PA 19103

EXAMINER

RIOS CUEVAS, ROBERTO JOSE

ART UNIT

PAPER NUMBER

2836

DATE MAILED: 11/21/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

P.S.

Office Action Summary

Application No.

09/690,183

Applicant(s)

KACHI ET AL.

Examiner

Roberto J Rios

Art Unit

2836

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 10, 17 and 18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-9 and 11-16, drawn to power conversion method and apparatus, classified in class 307, subclass 75.
 - II. Claims 10, 17 and 18, drawn to a vehicle, classified in class 180, subclass 65.3.
2. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP§806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the subcombination specifies details such as the use of MOSFET electrical components that are not required for the combination. The subcombination has separate utility such as any place where electrical power conversion is required, such as computers.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. A telephone call was made to Steven J. Rocci on 10/18/01 by Examiner Bryan Fischmann to request an oral election to the above restriction requirement. On 10/22/2001 an election to invention I was made without traverse.

5. Claims 10, 17 and 18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-9, and 11-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Sullivan et al (US patent 5,528,122).

As per claim 1, Sullivan et al (herein after Sullivan) teach a method of supplying power using a main DC power supply for generating a predetermined voltage to supply a first output voltage substantially equal to the predetermined voltage and a second output voltage lower than the predetermined voltage, comprising the steps of: connecting a first DC power supply (124) for generating the same voltage as the second output voltage in series to a second DC power supply (120) for generating a differential voltage between the first output voltage and the voltage from the first DC power supply,

thereby forming the main DC power supply; connecting a DC-DC converter to the second DC power supply; and stepping down the voltage output from the second DC power supply to produce the second output voltage by using the DC-DC converter (Figure 4; col. 8, line 8+).

As per claim 2, Sullivan teaches a power converting apparatus for generating a first output voltage and a second output voltage lower than the first output voltage, comprising a first DC power supply (124) for generating the same voltage as the second output voltage; a second DC power supply (120) connected in series to the first DC power supply, for generating a voltage corresponding to a difference between the first output voltage and the voltage from the first DC power supply; and a DC-DC converter, connected to the second DC power supply, for converting the voltage from the second DC power supply to the second output voltage (Figure 4; col. 8, line 8+).

As per claim 3, Sullivan teaches the DC-DC converter including a polarity inverting type DC-DC converter (col. 3, line 21), the second DC power supply is connected to an input of the polarity-inverting type DC-DC converter, and the first DC power supply is connected to an output of the DC-DC converter.

As per claim 4, Sullivan teaches the DC-DC converter including an insulated DC-DC converter (transformer 114), the second DC power supply is connected to an input of the insulated DC-DC converter, and the first DC power supply is connected to an output of the DC-DC converter (Figures 3, 4).

As per claim 5, Sullivan teaches a method of generating a boosted voltage higher than a voltage of a main DC power supply (124), comprising the steps of: producing a

differential voltage between a target boosted voltage and the voltage of the main DC power supply using a DC-DC converter; and producing the boosted voltage by adding the differential voltage to the voltage of the main DC power supply (Figure 4; col. 8, line 8+).

As per claim 6, Sullivan teaches a power converting apparatus for generating a predetermined boosted voltage, comprising: a DC power supply (124); and a DC-DC converter, connected to the DC power supply, for producing a differential voltage between the predetermined boosted voltage and a voltage of the DC power supply, wherein the predetermined boosted voltage is provided as a sum of the voltage of the DC power supply and the differential voltage (Figure 4; col. 8, line 8+).

As per claim 7, Sullivan teaches a power converting method of supplying a first output voltage substantially equal to a voltage of a main battery and a second output voltage lower than the voltage of the main battery, comprising the steps of: forming the main battery by connecting a first battery (124) for generating the same voltage as the second output voltage in series to a second battery (120) for generating a voltage corresponding to a difference between the first output voltage and the voltage of the first battery; producing the first output voltage by adding the voltages of the first and second batteries; connecting a charge power supply for generating a voltage lower than the voltage of the main battery to an output of a DC-DC converter; producing a differential voltage between the voltage of the main battery and the voltage of the charge power supply using the DC-DC converter; and charging the main battery with a sum of the differential voltage and the voltage of the charge power supply (Figure 4; col. 8, line 8+).

As per claim 8, Sullivan teaches a power converting apparatus for generating a first DC voltage and a second DC voltage lower than the first DC voltage, comprising: a first battery for generating the same voltage as the second DC voltage; a second battery, connected in series to the first battery, for generating a differential voltage between the first DC voltage and the voltage of the first battery; and a polarity-inverting type DC-DC converter (col. 3, line 21) having an input connected to the second battery and an output connected to the first battery, the DC-DC converter including a first switching element and a first diode connected in parallel to each other (col. 7, line 16), a second switching element (132) connected between the output of the DC-DC converter and the first battery, and a second diode connected in parallel to the second switching element (col. 7, line 16).

As per claim 9, Sullivan teaches the first switching element and the first diode being a first MOSFET and the second switching element and the second diode being a second MOSFET (col. 7, line 16).

As per claim 11, Sullivan teaches a power converting apparatus for a motor driven vehicle, comprising: a main battery assembly, connected between a high potential power supply and a low-potential power supply for generating a main output voltage for driving the vehicle motor, the main battery assembly including a first battery cell (124) for generating a first voltage lower than the main output voltage, and a second battery cell (120), connected in series to the first battery cell, for generating a second voltage corresponding to a difference between the main output voltage and the first voltage; and a DC-DC converter, connected to the second battery cell, for converting

the second voltage to a low voltage substantially equal to the first voltage (Figure 4; col. 8, line 8+).

As per claim 12, Sullivan teaches a first voltage sensor for detecting the main output voltage, and a second voltage sensor for detecting the low voltage (col. 8, line 37); and wherein the DC-DC converter includes: a switching element responsive to a control signal; an inductance connected in series to the switching element; and a control circuit, connected to the switching element and the first and second voltage sensors (Figure 4), for supplying the switching element with the control signal for controlling ON and OFF actions of the switching element based on detection signals from the first and second voltage sensors (col. 8, line 40).

As per claim 13, Sullivan teaches the switching element including a MOSFET (Figures 3, 4).

As per claim 14, Sullivan teaches the control circuit including: a triangular wave oscillator for generating a triangular wave signal having a predetermined cycle; and a comparator for comparing a difference between detection signals from the first and second voltage sensors with the triangular wave signal and generating a pulse signal according to a comparison result, wherein the control circuit sends the pulse signal as the control signal to the switching element (Figure 6; col. 10, line 49).

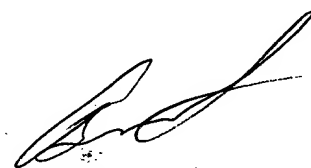
As per claim 15, Sullivan teaches the control circuit controlling a ratio of an ON time of the switching element to an OFF time thereof by changing a pulse width of the pulse signal, thereby adjusting a level of the low voltage (col. 9, line 47).

As per claim 16, Sullivan teaches the comparator generating a high-level pulse signal when the difference between the detection signals from the first and second voltage sensors is greater than the triangular wave signal and generates a low-level pulse signal when the difference between the detection signals from the first and second voltage sensors is smaller than the triangular wave signal (col. 10, line 54).

8. Art of general nature relating to power converting apparatus has been cited for applicant's review.

Communication with PTO

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberto Rios whose telephone number is (703) 306-5518. In the event that Examiner Rios cannot be reached, his supervisor, Brian Sircus may be contacted at (703) 308-3119. The fax number for Before-Final communications is (703) 872-9318, for After-Final communications is (703) 872-9319, and for Customer Service is (703) 872-9317.



BRIAN SIRCUS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Roberto J. Rios
Patent Examiner